GTAACAAAGGATTTAGAGTACTTCCCAGAGACCGATAAGGTATGGATTGAGATCGGAGAAACAGAAGGAACA
TTCATCGTGGATAGCGTGGAATTACTCCTTATGGAGGAA

5.14.6 NUCLEIC ACID SEQUENCE OF *CRY1C.499* (SEQ ID NO:11)

ATGGAGGAAAATAATCAAAATCAATGCATACCTTACAATTGTTTAAGTAATCCTGAAGAAGTACT
TTTGGATGGAGAACGGATATCAACTGGTAATTCATCAATTGATATTTCTCTGTCACTTGTTCAGT
TTCTGGTATCTAACTTTGTACCAGGGGGAGGATTTTTAGTTGGATTAATAGATTTTGTATGGGGA
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AGCTGAATTTGCTAGGAATGCTGCTATTGCTAATTTAGAAGGATTAGGAAACAATTTCAATATAT
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CTGTAATTTTTGGAGAAAGATGGGGATTGACAACGATAAATGTCAATGAAAACTATAATAGACTA
ATTAGGCATATTGATGAATATGCTGATCACTGTGCAAATACGTATAATCGGGGATTAAATAATTT
ACCGAAATCTACGTATCAAGATTGGATAACATATAATCGATTACGGAGAGACTTAACATTGACTG
TATTAGATATCGCCGCTTTCTTTCCAAACTATGACAATAGGAGATATCCAATTCAGCCAGTTGGT
CAACTAACAAGGGAAGTTTATACGGACCCATTAATTAATTTTAATCCACAGTTACAGTCTGTAGC
TCAATTACCTACTTTTAACGTTATGGAGAGCAGCGCAATTAGAAATCCTCATTTATTTGATATAT
TGAATAATCTTACAATCTTTACGGATTGGTTTAGTGTTGGACGCAATTTTTATTGGGGAGGACAT
CGAGTAATATCTAGCCTTATAGGAGGTGGTAACATAACATCTCCTATATATGGAAGAGAGGCGAA
CCAGGAGCCTCCAAGATCCTTTACTTTTAATGGACCGGTATTTAGGACTTTATCAAATCCTACTT
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GCAACTCTTACAAATACAATTGATCCAGAGAGAATTAATCAAATACCTTTAGTGAAAGGATTTAG
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TTAAGATTTCGTTACGCTTCCAGTAGGGATGCACGAGTTATAGTATTAACAGGAGCGGCATCCAC
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ATAATTGGGATAAGTGAACAACCTCTATTTGGTGCAGGTTCTATTAGTAGCGGTGAACTTTATAT
AGATAAAATTGAAATTATTCTAGCAGATGCAACATTTGAAGCAGAATCTGATTTAGAAAGAGCAC
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ATCCAAACTTCAGAGGGATCAATAGACAACCAGACCGTGGCTGGAGAGGAAGTACAGATATTACC
ATCCAAGGAGGAGATGACGTATTCAAAGAGAATTACGTCACACTACCGGGTACCGTTGATGAGTG
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GACTTAAATGAGGACTTAGGTGTATGGGTGATATTCAAGATTAAGACGCAAGATGGCCATGCAAG
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GAGCGGAGAAGAAGTGGAGAGACAAACGAGAGAAACTGCAGTTGGAAACAAATATTGTTTATAAA
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GCGTATTCCTTATATGATGCGAGAAATGTCATTAAAAATGGCGATTTCAATAATGGCTTATTATG
CTGGAACGTGAAAGGTCATGTAGATGTAGAAGAGCAAAACAACCACCGTTCGGTCCTTGTTATCC
CAGAATGGGAGGCAGAAGTGTCACAAGAGGTTCGTGTCTGTCCAGGTCGTGGCTATATCCTTCGT

GTCACAGCATATAAAGAGGGATATGGAGAGGGCTGCGTAACGATCCATGAGATCGAAGACAATAC
AGACGAACTGAAATTCAGCAACTGTGTAGAAGAGGAAGTATATCCAAACAACACAGTAACGTGTA
ATAATTATACTGGGACTCAAGAAGAATATGAGGGTACGTACACTTCTCGTAATCAAGGATATGAC
GAAGCCTATGGTAATAACCCTTCCGTACCAGCTGATTACGCTTCAGTCTATGAAGAAAAATCGTA
TACAGATGGACGAAGAGAGAATCCTTGTGAATCTAACAGAGGCTATGGGGATTACACACCACTAC
CGGCTGGTTATGTAACAAAGGATTTAGAGTACTTCCCAGAGACCGATAAGGTATGGATTGAGATC
GGAGAAACAGAAGGAACATTCATCGTGGATAGCGTGGAATTACTCCTTATGGAGGAA

5.15 EXAMPLE 15 -- ISOLATION OF TRANSGENIC PLANTS RESISTANT TO CRY* VARIANTS

5.15.1 PLANT GENE CONSTRUCTION

The expression of a plant gene which exists in double-stranded DNA form involves transcription of messenger RNA (mRNA) from one strand of the DNA by RNA polymerase enzyme, and the subsequent processing of the mRNA primary transcript inside the nucleus. This processing involves a 3′ non-translated region which adds polyadenylate nucleotides to the 3′ end of the RNA. Transcription of DNA into mRNA is regulated by a region of DNA usually referred to as the "promoter". The promoter region contains a sequence of bases that signals RNA polymerase to associate with the DNA and to initiate the transcription of mRNA using one of the DNA strands as a template to make a corresponding strand of RNA.

A number of promoters which are active in plant cells have been described in the literature. Such promoters may be obtained from plants or plant viruses and include, but are not limited to, the nopaline synthase (NOS) and octopine synthase (OCS) promoters (which are carried on tumor-inducing plasmids of *Agrobacterium tumefaciens*), the cauliflower mosaic virus (CaMV) 19S and 35S promoters, the light-inducible promoter from the small subunit of ribulose 1,5-bisphosphate carboxylase (ssRUBISCO, a very abundant plant polypeptide), and the Figwort Mosaic Virus (FMV) 35S promoter. All of these promoters have been used to create various types of DNA constructs which have been expressed in plants (see *e.g.*, U. S. Patent No. 5,463,175, specifically incorporated herein by reference).

The particular promoter selected should be capable of causing sufficient expression of the enzyme coding sequence to result in the production of an effective amount of protein. One set of preferred promoters are constitutive promoters such as the

CaMV35S or FMV35S promoters that yield high levels of expression in most plant organs (U. S. Patent No. 5,378,619, specifically incorporated herein by reference). Another set of preferred promoters are root enhanced or specific promoters such as the CaMV derived 4 as-1 promoter or the wheat POX1 promoter (U. S. Patent No. 5,023,179, specifically incorporated herein by reference; Hertig *et al.*, 1991). The root enhanced or specific promoters would be particularly preferred for the control of corn rootworm (*Diabroticus* spp.) in transgenic corn plants.

The promoters used in the DNA constructs (*i.e.* chimeric plant genes) of the present invention may be modified, if desired, to affect their control characteristics. For example, the CaMV35S promoter may be ligated to the portion of the ssRUBISCO gene that represses the expression of ssRUBISCO in the absence of light, to create a promoter which is active in leaves but not in roots. The resulting chimeric promoter may be used as described herein. For purposes of this description, the phrase "CaMV35S" promoter thus includes variations of CaMV35S promoter, *e.g.*, promoters derived by means of ligation with operator regions, random or controlled mutagenesis, *etc.* Furthermore, the promoters may be altered to contain multiple "enhancer sequences" to assist in elevating gene expression.

The RNA produced by a DNA construct of the present invention also contains a 5′ non-translated leader sequence. This sequence can be derived from the promoter selected to express the gene, and can be specifically modified so as to increase translation of the mRNA. The 5′ non-translated regions can also be obtained from viral RNA's, from suitable eucaryotic genes, or from a synthetic gene sequence. The present invention is not limited to constructs wherein the non-translated region is derived from the 5′ non-translated sequence that accompanies the promoter sequence.

For optimized expression in monocotyledenous plants such as maize, an intron should also be included in the DNA expression construct. This intron would typically be placed near the 5′ end of the mRNA in untranslated sequence. This intron could be obtained from, but not limited to, a set of introns consisting of the maize *hsp70* intron (U. S. Patent No. 5,424,412; specifically incorporated herein by reference) or the rice